# What Are Information Systems?

Based on Chapter 1 of Bennett, McRobb and Farmer:

*Object Oriented Systems Analysis and Design Using UML*, (3rd Edition), McGraw Hill, 2005.

# In This Lecture You Will Learn:

- How to define an Information System (IS)
- Some examples and types of IS
- How to apply basic concepts of systems theory to IS
- How IS are related to organizations

# McGregor On-Line Retail Site

- A typical modern IS with:
  - Online catalogue display and shopping cart
  - Back-office systems store stock details, orders, payment transactions, and more
  - Communications link to credit-card processing centre
  - Robot warehouse control system
  - Delivery scheduling

# Elements of an IS

- Every IS has:
  - A human activity that needs information
  - Some stored data
  - An input method for entering data
  - Some process that turns the data into information
  - An output method for representing information

# The Role of the Computer

- Computers carry out tasks also done by people and by other technologies
  - *Storage*: signalman's memory / hard disk
  - *Display*: Battle of Britain map / PC screen
  - *Calculation*: mental arithmetic / program
  - *Communication*: telephone line / LAN
- Typical advantages of computers:
  - high speed, low cost, reliability

# System Transformation

- All useful systems *transform* their inputs into useful outputs
- For IS, both inputs and outputs are typically information
- This *transformation* is the whole reason for building and operating the system

# Transformation Example

- McGregor's *Delivery Scheduling System* may have inputs:
  - Information about orders, available stock, customer addresses, vehicle capacities…
- …And may have outputs:
  - Which orders to load on each vehicle, what route the vehicle should follow…
- How does this benefit McGregor?

# Characteristics of Systems

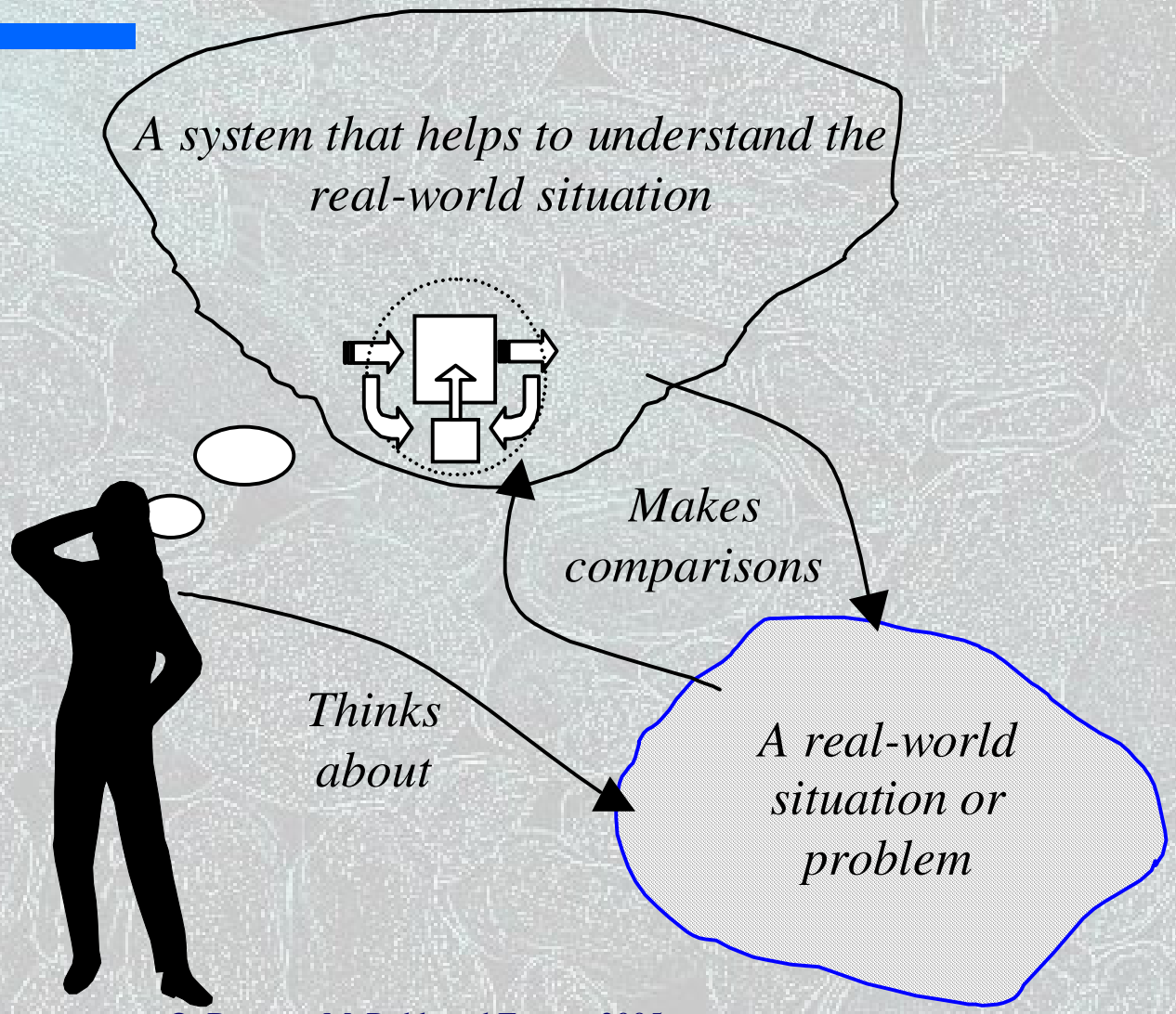
- IS are like any other kind of system
- Every system has:
  - Inputs and outputs
  - A purpose (related to transformation)
  - A boundary and an environment
  - Subsystems and interfaces
  - Control using feedback and feed-forward
  - Some emergent property

# Are Systems Real?

Maybe, maybe not!

- Systems thinking is useful because it helps to analyse and understand problems
- What matters is the understanding you achieve
- You can choose to see *anything* as a system, whether or not it really is one

# Systems and the Real World



# Types of IS

- Information Systems are used to support people's activities
  - Store and retrieve information
  - Carry out calculations
  - Aid communication
  - Control and schedule work
  - Other support … ?

# Types of IS (cont'd)

- Operational Systems assist or control business operations
  - An Accounting System replaces costly and error-prone human clerks
- Management Support Systems help managers to decide or to communicate
  - A Delivery Scheduling System helps decide how to load and route the delivery trucks

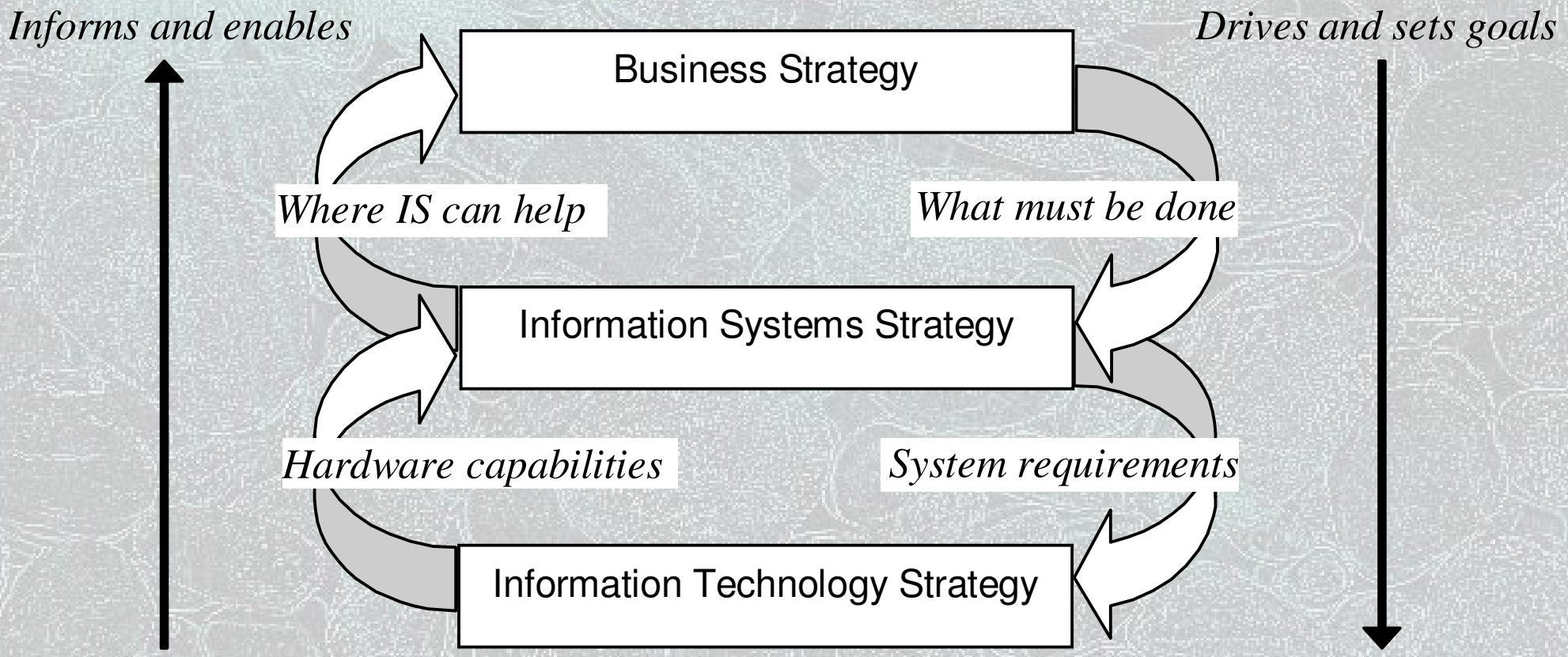
# Types of IS (cont'd)

- Real-time Control Systems typically operate physical equipment, often in safety-critical settings
  - Some cars have an Engine Management System to control fuel supply and ignition

# How Do IS Relate to the Human Activity System?

- We can view an organization as a system, perhaps with many subsystems
- Ideally, each subsystem helps the overall system fulfil its purpose
- IS are also subsystems and should help to meet goals of people in the organization

# Strategy and Planning for IS



# Summary

In this lecture you have learned about:

- What an IS is
- Some examples and types of IS
- Some basic concepts of systems theory and how to apply them to IS
- How IS are related to organizations

# References


- Bennett, McRobb and Farmer (2005)
- Checkland and Scholes (1990)

(For full bibliographic details, see Bennett, McRobb and Farmer)